

CellX PT

Multi-Wavelength Laser Engine

CellX PT enables next-generation life science instrumentation by delivering the solution to the industry's demand for lower cost, miniaturization, and reliability.

In CellX PT, Coherent brings together vertical integration in solid-state lasers, PermaTrack™ beam delivery optics, and robotic assembly into a next generation multi-wavelength laser engine platform. A compact OEM solution for high-volume users, CellX PT delivers unparalleled and industry-defining performance, size, and cost-of ownership.

Features and Benefits

- Four laser output with certified beam focus size and geometry
- Hermetically sealed with PermAlign assembly for an ultra-compact and robust engine
- Configurable wavelength, output power, and stripe pattern to your specific OEM customer requirements

Applications

- Flow Cytometry
- Cell Sorting



Specifications below are for the CellX PT Development Laser only. Performance is typical and indicative of CellX PT platform performance. Contact your Coherent Sales partner to discuss configuring a CellX PT model for your specific requirements.

SPECIFICATIONS	405	488	561	637
Part Number	1384988			
Wavelength ¹ (nm)	405	488	561	637
Nominal Output Power ² (mW)	100			
Maximum Output Power ² (%)	110			
Working Distance from CellX PT to Focus Location ³ (mm)	21.8			
Beam Profile at Focus ⁴	Gaussian, TEM ₀₀ (both axes)			
Focus Spot Size Vertical ⁵ (μm) (1/e ²)	8 ±2			
Side-lobes at Focus, Vertical ⁵ (% of peak)	<5	<3	<3	<5
Beam Waist Location Accuracy ⁵ (μm)	±50	0 (Reference)	±40	±35
Focus Spot Size Location Vertical ^{4,5} (μm)	-100±5	0 (Reference)	100±5	200±5
Pitch (Vertical) Angle ⁴ (mRad)	0 ±5			
Focus Spot Size Horizontal ⁵ (μm) (1/e ²)	80 ±10			
Focus Spot Size Location Horizontal ^{4,5} (μm)	0±3	0 (Reference)	0±3	0±3
Yaw (Horizontal) Angle ⁴ (mRad)	0 ±5			
Pattern Centroid Adjustment ⁶ (μm)	±250 in X, Y, and Z			
Pointing Stability Over Temperature ⁷ (μm/°C)	<0.2			
RMS Noise ⁸ (%) (20 Hz to 20 MHz)	<0.25			
Peak-to-Peak Noise ⁸ (%) (20 Hz to 20 kHz)	<1			
Long-Term Power Stability (%) (8 hours, ±3° C)	<2			
Warm-Up Time ⁹ (minutes) (from Cold Start)	<5			
Polarization Extinction Ratio	>50:1	>75:1	>50:1	>50:1
Polarization Azimuth (°)	Vertical, ±5			
Laser Safety Classification ¹⁰	Class 4			

1 Center wavelength tolerance 405 ±5 nm, 488 ±2 nm, 561 ±2 nm, 637 +3/-5 nm. 637 nm includes bandpass filter to remove any Amplified Spontaneous Emission (ASE).

2 Power measured at output of CellX PT.

3 In air. Measured between Z₀ and last surface of objective lens mount with lens mount in nominal position. 54.1 mm between Z₀ and reference dowell pin location in unit base.

4 Measured at Z₀. Referenced to Golden Standard fixture.

5 Measured at Z₀. All parameters labelled with Note 4 achieve specified performance at the same Z₀ plane. Beam Waist Location tolerance represents ±50% of Rayleigh Range at nominal vertical beam size.

6 Adjustment of the centroid of the fixed stripe pattern in X, Y and Z.

7 Relative to 488 nm channel.

8 RMS Noise and Peak-to-Peak Noise are per laser channel during CW operation.

9 Typical laser power-on delay of 1 minute from cold start.

10 OEM product does not comply with CDRH 21CFR 1040.10 and 1040.11 without appropriate integration.

ELECTRICAL SPECIFICATIONS

Power Consumption (W)	<50 (typical 20 at 25°C baseplate temperature)
Supply Voltage ¹ (VDC)	12 to 24
Power Input Connector	Single Row 2-pin (Molex P/N 2002411222; mating connector 2004561212)
Control Interface Connectors	1) USB Mini-B 2) 50-pin Connector (Molex PN 501571-5007; mating connector 501189-5011) for RS-232, digital and analog modulation, interlock, keyswitch, status
Laser Drive Modes (four Operating Modes, individually selected for each wavelength thru USB or RS-232)	1) CW with Power Control via USB/RS-232 2) Analog Modulation 3) Digital Modulation 4) Mixed Analog and Digital Modulation

DIGITAL MODULATION

Voltage and Impedance	3.3 V (5 V tolerant) 2 kΩ input impedance
Maximum Bandwidth (kHz)	1
Rise Time (10% to 90%) (μsec)	<500
Fall Time (10% to 90%) (μsec)	<500
Modulation Depth (extinction ratio)	Infinite
Power Range	Modulate from 0% to Set Power (USB or RS-232) in Digital Mode

ANALOG MODULATION

Voltage and Impedance	0 to 5 V Full Scale, 2 kΩ input impedance
Maximum Bandwidth, 3 dB (kHz)	1
Rise Time (10% to 90%) (μsec)	<500
Fall Time (10% to 90%) (μsec)	<500
Modulation Depth (extinction ratio)	>50:1
Power Range	Modulate from 0% to 110% with 0 to 5 V in Analog Mode

ENVIRONMENTAL SPECIFICATIONS

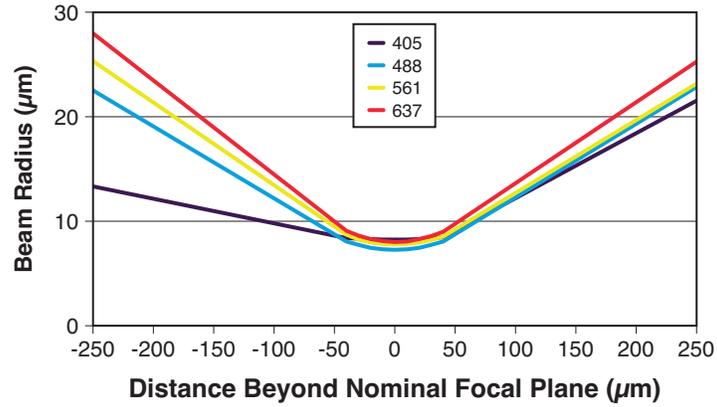
Dimensions (mm)	100 x 135 x 50 (see drawing)
Baseplate Operating Temperature ² (°C)	20 to 35
Non-Operating Condition (°C)	-20 to +60
Weight (kg)	1.15
Shock Tolerance (G, 6 ms)	30
ESD Protection	EN61326-1

¹ Nominal voltage allowing for typical +/-5% tolerance in supply voltage.

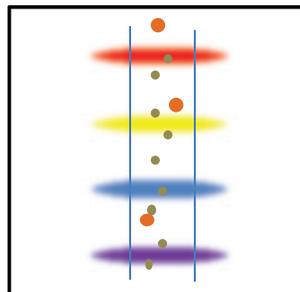
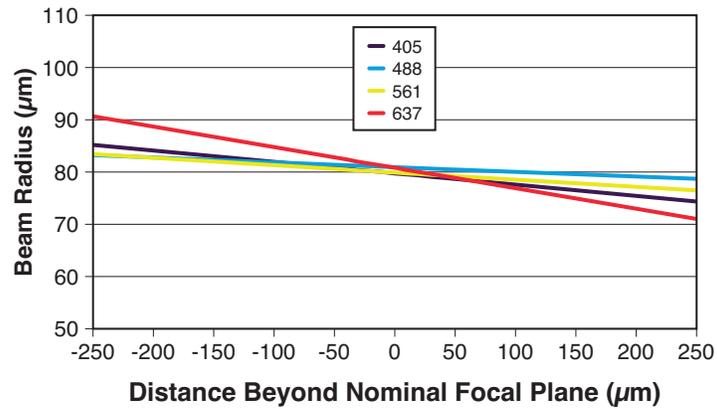
² Recommendation to operate with baseplate temperature stabilized to within ±3°C within the 20 to 35°C range.

NOMINAL OPTICAL PERFORMANCE

CellX PT Nominal Beam Performance Through Focus
Vertical $1/e^2$ Beam Diameter



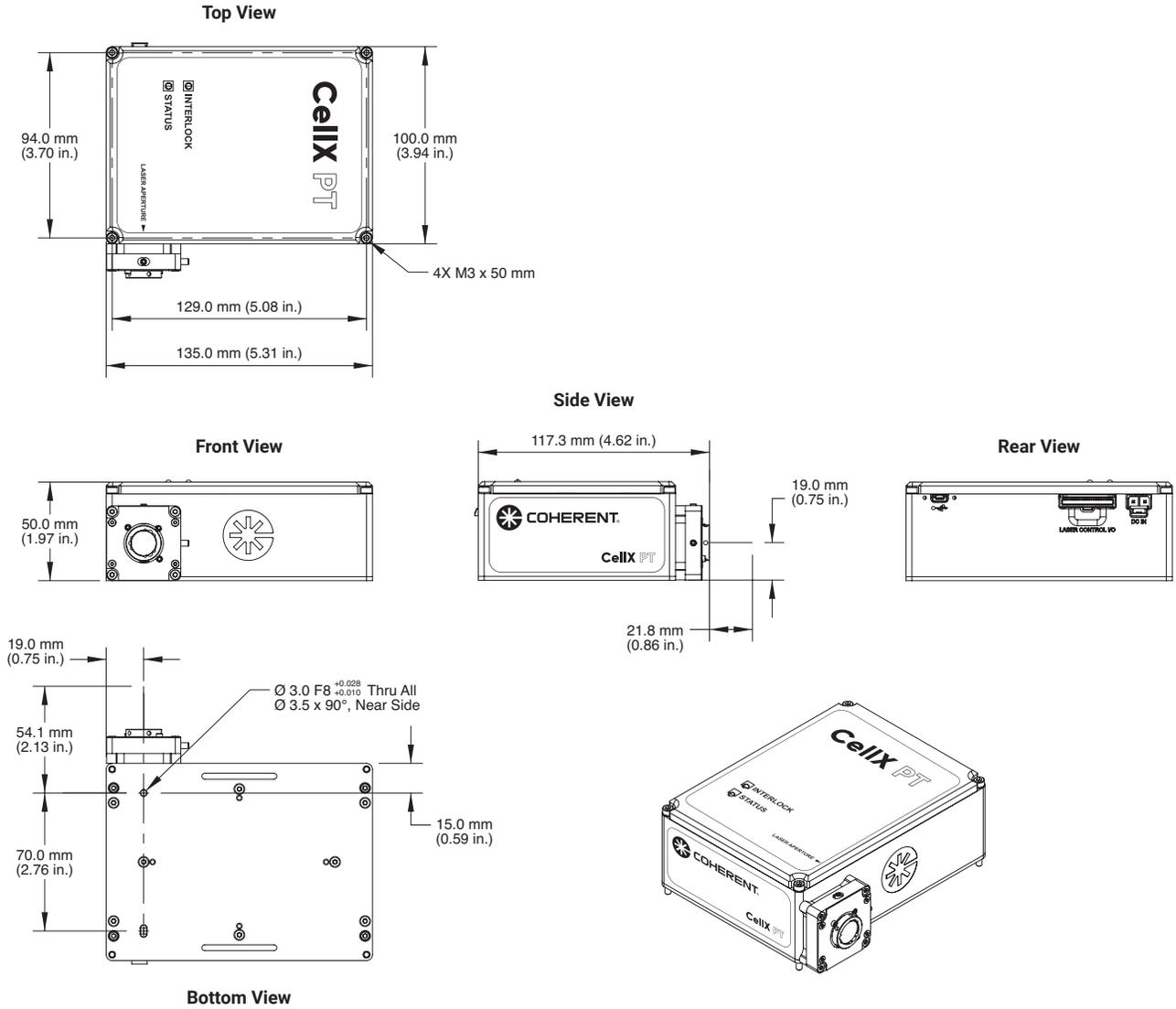
CellX PT Nominal Beam Performance Through Focus
Horizontal $1/e^2$ Beam Diameter



Four Laser Focus with Separated Positions (set permanently during manufacture)

MECHANICAL SPECIFICATIONS

CellX PT



Coherent, Inc.,
 5100 Patrick Henry Drive Santa Clara, CA 95054
 p. (800) 527-3786 | (408) 764-4983
 f. (408) 764-4646

tech.sales@coherent.com www.coherent.com

Coherent follows a policy of continuous product improvement. Specifications are subject to change without notice.

Coherent offers a limited warranty for all CellX PT Laser Engines. For full details of this warranty coverage, please refer to the Service section at www.coherent.com or contact your local Sales or Service Representative.

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